US3

USER MANUAL

2.2

PLEASE TAKE TIME TO READ THIS USER GUIDE BEFORE INSTALLING YOUR SEAL SCRAMMER

INDEX

1. BEFORE YOU START

1.1. Check the Contents

1 x Under Water Body

1 x Under Water Cable

1 x Harsh Environment Shell

1 x Top control box (pre-attached)

1 x AC connector

1 x User Guide

TDX Trigger Device(s) - *Silent Scrammers only*

1.2. Contact Information

For advice or technical assistance contact Ace Aquatec:

EMAIL: sales@aceaquatec.com

For returns, repairs, calibration or annual servicing send to:

ACE AQUATEC LTD,

C/O NEPTUNE SONAR LTD.

KELK LAKE, KELK, DRIFFIELD, YORKSHIRE,

YO25 8HG

1.3. About this Guide: Colour Code

Text in green is ADVISORY.

Text in red indicates MANDATORY. If unheeded, may result in sub-optimal performance or DAMAGE.

1.4. Equipment Warning

Never connect ANY part of a 1st generation Ace Aquatec scrammer to any part of a 2nd or 3rd generation system. (Including cables and triggers).

SEVERE DAMAGE will result and neither unit will function without repair.

1.5. Environmental Note

Underwater noise pollutes the environment and disturbs

dolphins and whales.

By **not** making sounds unnecessarily the US3 balances the welfare of the fish against the needs of the environment. The acoustic output of the scrammer is designed to be inaudible to fish thereby avoiding stress.

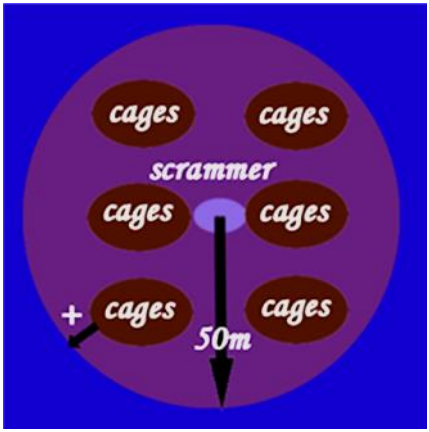
1.6. Safety First

The US3 produces high levels of under-water noise. The hearing of divers will not be damaged by accidental exposure to this level but the sudden sound might startle the diver.

If divers are operating near the scrammer it MUST BE SWITCHED TO MUTE MODE.

2. PLANNING INSTALLATION

2.1 Number of underwater bodies



The US3 has a nominal deterrence range of **50 METRES** (harbour & grey seals).

Site your scrammer in a centralised position to the area that you wish to protect.

2.2 Number of Motion Trigger Devices

The number of Trigger Devices depends upon the size and shape of your pens:

The more Triggers the higher the probability an excited fish will contact and initiate a scram.

SQUARE PEN RECOMMENDATIONS:

PEN SIZE	TRIGGERS PER PEN
12m / 15m steel cages	2
24m steel cages	4

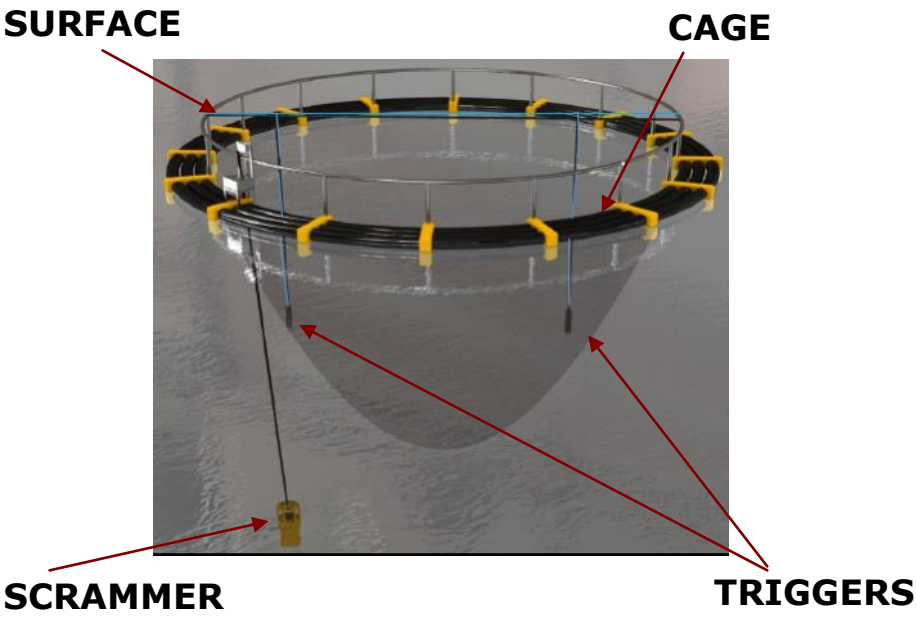
CIRCULAR PEN RECOMMENDATIONS:

PEN SIZE	TRIGGERS PER PEN
70m polar	2
Up to 100m polar	3
100m +	4+

2.3 Positioning Equipment:

UNDERWATER BODY MUST BE IMMERSED TO A DEPTH GREATER THAN 5M

UNDERWATER BODY Suspended:	TRIGGERS Suspended:
>1 metre below the deepest point of the growing net >2 meters above the sea bed Preferably midwater.	Clear of underwater obstructions (the nets themselves, adaptive feeders, lights etc.) Preferably below the normal feeding zone of the fish. Within 50m of scrammer.



3. INSTALLING EQUIPMENT

3.1 Unpacking the Equipment

Harsh Environment Shell

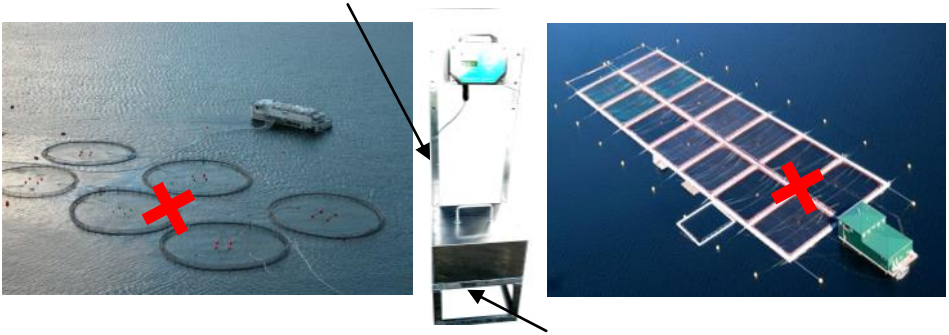
Top Control Box

Underwater Body

Cable

3.2 Fixing Harsh Environment to Cage

Uprights should be lashed to the handrail using rope.

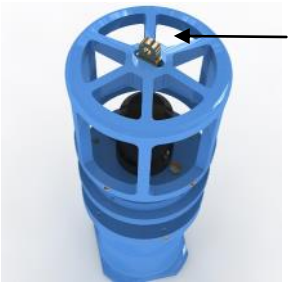


The base should be lashed to the walkway.

3.3. Connecting the Underwater Body

OPTIONAL A sinker plate has been attached to the underwater body with 4 nylon screws to increase its weight. This can be removed if so desired. Sinker plates need replacing every 2-3 years.

STEP 1:



A rope should be tied through the top neck/cage of the underwater body (or a shackle attached to the central strong point) and the other end attached to a suitable anchor point in order to take the weight of the US3. Ensure rope does not make contact with the black transducer.

STEP 2:

Connect the male end of the black cable to the female socket on the underwater body. (Ensure pins are properly aligned before pushing. While holding the cable, push connector until there is no gap and screw the red knurled cap until hand-tight)

STEP 3:

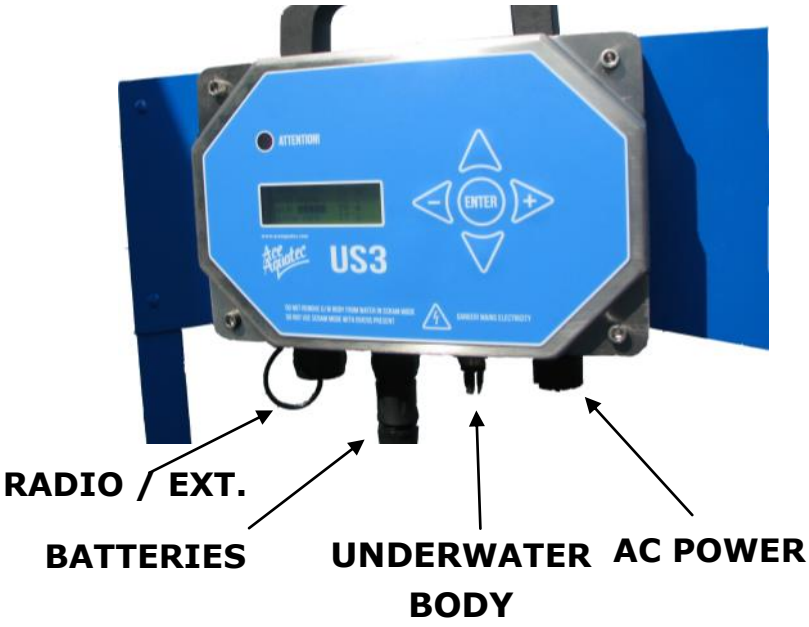
Ensure the cable exits through the top rather than the side of the scrammer's cage.

STEP 4:

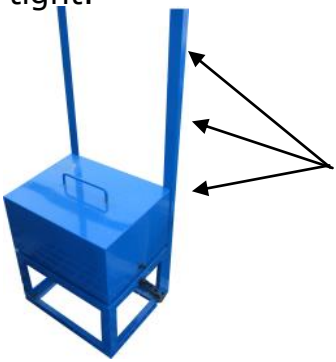
Deploy to the correct depth (see 2.3) ensuring cable is slack and weight is taken by the rope.

Never power up the scrammer unless the transducer is submerged in water. Testing in air will damage the hydrophone!

3.4. Connecting the Control Box



STEP 1: Plug the female end of the black underwater cable into the male socket beneath the surface electronics. Ensure there is no gap and the red cap is screwed finger tight.



STEP 2: Additional tie-wraps (or rope) should be used to secure the cable to the right hand Harsh Environment uprights ensuring there is some slack.

3.5. Connecting Power Sources

The US3 runs from **AC and/or batteries**.

If the power source is weak the scrammer will switch itself off as the internal battery discharges. It will eventually enter MUTE mode until an adequate external source has been connected.

3.5.1. Batteries

The US3 takes **1** or **2** external **12V**, **75, 85, or 100 AHr** batteries (L. 302cm x W. 172cm x H. 225cm)

2 batteries are recommended if you are not connecting to AC. Rotate a 3rd battery for most efficient use.

STEP 1: Remove aluminium lid. Locate battery cable. Ensure cable is fed through the base hole to the junction box.

STEP 2: Connect battery cable into the left battery port on the control box. Cable tie cable to left harsh environment uprights leaving some slack.

STEP 3: Insert 1, or 2, 12 volt battery/ies with terminals facing inwards. Attach red leads to "+" (P) and brown (black) leads to "-" (N).

STEP 4: Once battery leads are connected replace aluminium lid and lock with rubber clips (if only one battery is used, cable-tie the battery cables to the central anchor point).

3.5.2. Connecting Mains AC

If AC is connected the US3 automatically recharges the external battery/ies and will switch to battery automatically if AC is lost.

An Amphenol ecomate 4 pin connector has been supplied for connecting to an AC power source (90 to 264 V)

The 4 connections are:

2 — Live, 1 — Neutral, E — (triangle of 3 horizontal lines arranged as an inverted triangle) Earth, 3 — Not connected. (US3 requires 1amp—75 watts)

WARNING! Never attempt to connect AC cable to battery connector input on the top box! Never unscrew front panel of control while connected. **Opening control box may invalidate your warranty.**

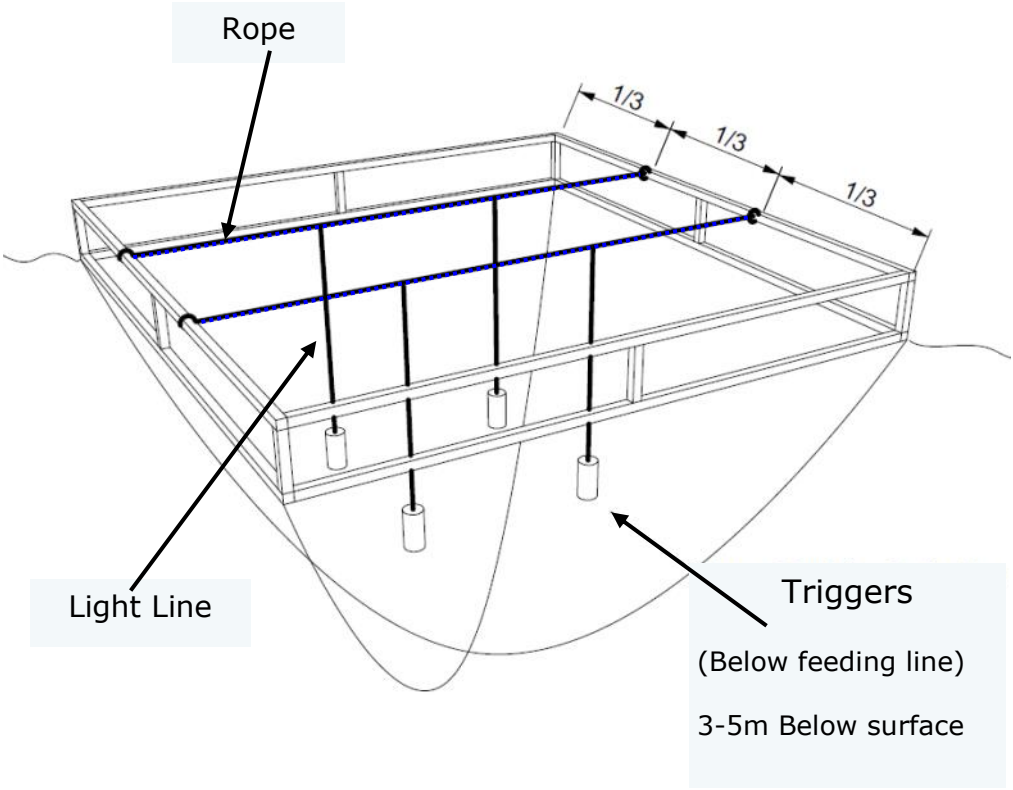
3.6 Deploying the Trigger Devices

REMOVE MAGNETS BEFORE USE TO SWITCH ON. REPLACE TO SWITCH OFF.

FRAGILE! HANDLE CAREFULLY!

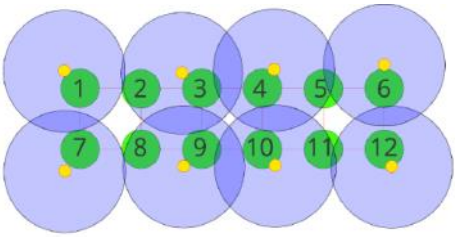
RECORD WHICH DEVICE IS IN WHICH PEN. LEAVE THE MAGNETS IN A SAFE PLACE ASHORE.

3.6.1 Hanging Suggestions for Fish Motion Detector Triggers

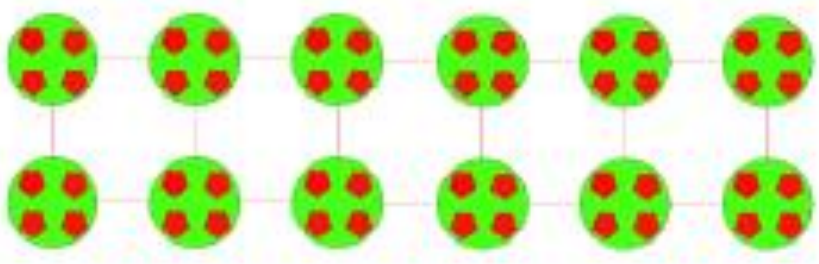


Depth: Not critical. However, potential effects of storms and tides should be considered to prevent false alarms (from contact with growing nets or any other underwater obstacle).

Varying threshold: If the growing nets do hit the device regularly then the system de-sensitises and fish panicking may not be detected.

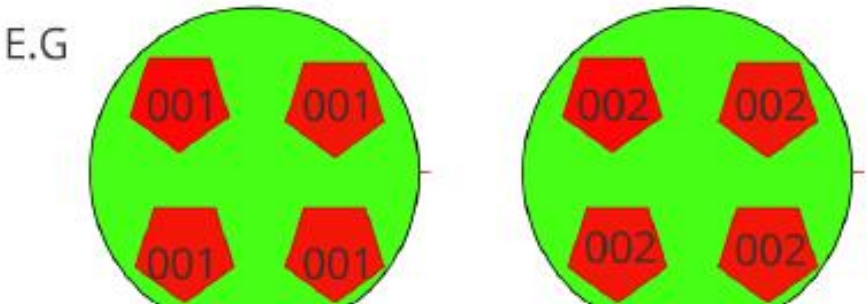


A site diagram will have been provided by Ace Aquatec showing the position of your US3 deterrents (yellow dots, with a blue circle for coverage), your grids (black squares) and you cages (green circles).



Deployment of fish motion detector triggers will have been marked in red as above.

Fish Motion Triggers have a serial code on the top which matches the cage number where you intend to install them e.g all triggers with the code 001 should be hung in cage 1, all 002s should be placed in cage 2 and so on, as illustrated below.

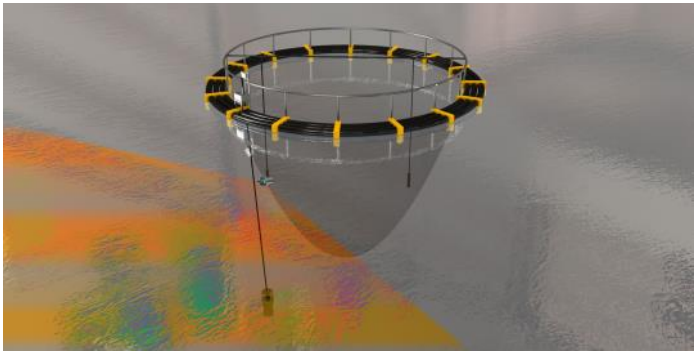


- Triggers should be hung as indicated in the diagrams
- Hang triggers with light line through the trigger's top holes
- Add the provided shackles to the top of triggers for tidal sites.
- Once triggers are set up in the cages proceed to set which US3 top box should listen to which set of triggers.

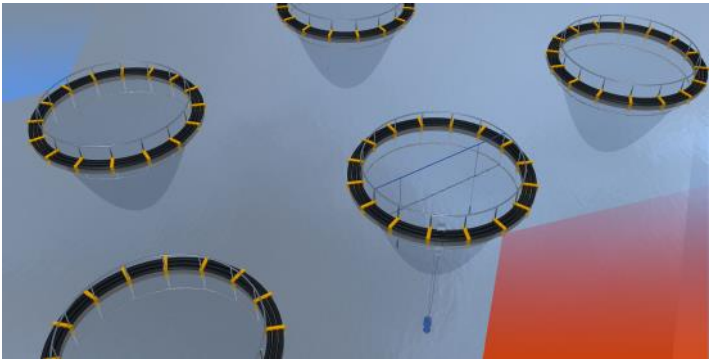
See 4.1.4 for setting Us3 top boxes to listen to particular triggers.

3.6.2 Hanging Suggestions for Sonar Triggers

SONAR triggers should be fixed to the edge of the cage facing the direction of seal approaches. Optimal depth is 1-2 metres but this will depend on the severity of waves.

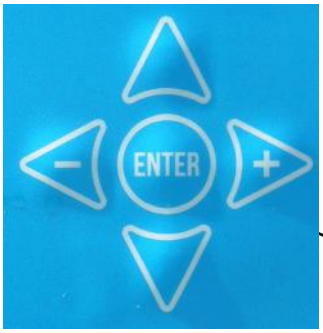


One trigger should be deployed on each of the inner cages of the grid. Two triggers should be deployed on the cages at either end of the grid.

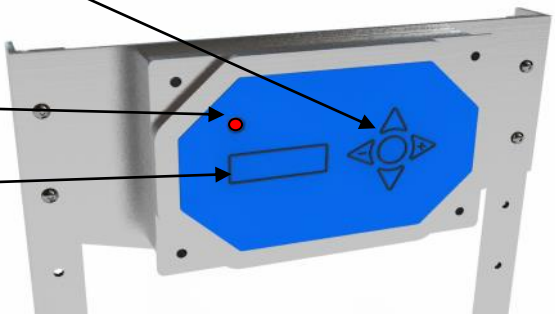


4. GETTING STARTED

4.1. UNDERSTANDING THE DISPLAY



TOUCH PAD:
The cursor on the display is moved by pressing the up, down, left and right arrows on the touch pad. The central ENTER button selects an option.



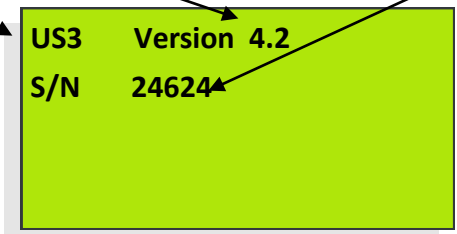
WARNING BEACON: to attract attention in the event of low batteries or a fault.

USER DISPLAY: will light up as soon as the user hits a key on the key pad.

WELCOME SCREEN

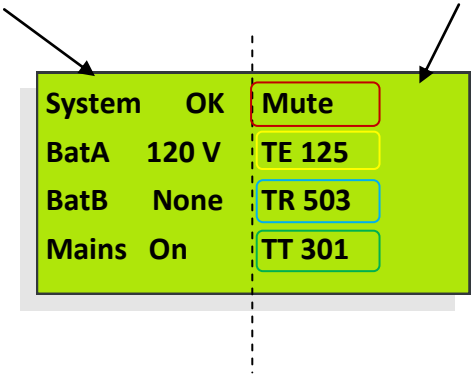
ENTER THE UNLOCK CODE SUPPLIED BY EMAIL!

Model, software version, serial number



4.2 STANDBY SCREEN

Power readings (left) & **System Status** (right).



4.2.1 System Status (right)

The system is either in **Mute** mode (making no noise) or **Scram** mode (making noise).

Triggered events: TE 125 valid trigger events since last reset. These are registered from externally connected devices, such as motion detector triggers or sonar triggers.

Triggered scrams:TR 503 scrams made by the scrammer in response to TE's

Timed: TT. 301 timed scrams since reset. These are determined by the rate and do not include triggered scrams.

4.2.2 Power Readings (left)

These occupy the left hand side of the screen and should be checked regularly.

"**SYSTEM OK"** lets you know everything is operating correctly. Alerts such as low batteries or communications failure will display here.

System	OK	Mute
BatA	120 V	TE 0
BatB	None	TR 0
Mains	On	TT 0

EXT A + **EXT B** are the external batteries attached to the control box. Here, Battery A is reading **12.0V**. No 2nd battery is attached (**NONE**).

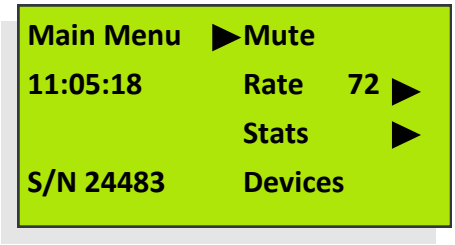
Batteries should be changed when readings fall below 12 V. At 11V **"BAD"** appears indicating a dead battery (attention light will be lit in the event of "BAD" appearing (see 4.8))

When Mains **AC** is connected the status reads **"ON".** When AC is not connected it reads "**OFF**".

Press any key to go to the "**MAIN MENU**".

4.3. MAIN MENU

On the left you find a real time clock and the product's serial number. The right has settings that can be toggled by the user.



4.3.1 SELECTING A MODE

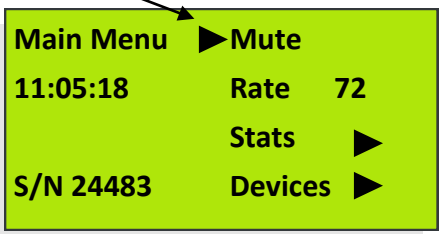
ONLY SCRAM WITH U/W BODY IN WATER!

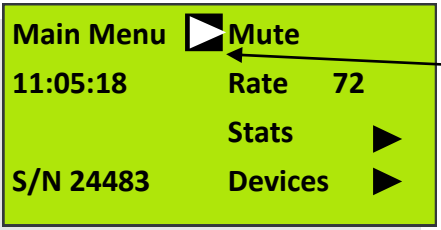
The user can scroll through **two functions** on the first line.

Option 1: MUTE - effectively means the scrammer is OFF. It is listening but not making noise.

Option 2: SCRAM—the scrammer is operational and will make a noise, either when triggered or on a timed basis depending on the rate figure selected.

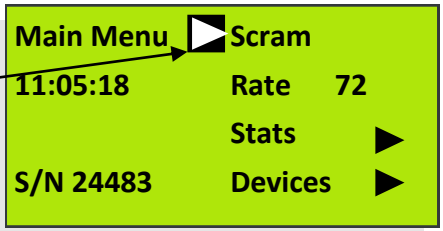
1. Move the triangle cursor to the **MUTE** function using the ▲ and ▼ arrow keys.

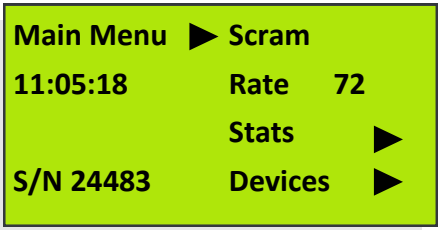




2. Press **ENTER** to highlight the option.

3) Press **or** to scroll to next option (**SCRAM** or **MUTE**).





4) When you reach the option you require, press **ENTER**.

Note: Repeat steps to return the scrammer to **MUTE**.

If **SCRAM** is selected a safety screen appears giving the user 10 seconds to **abort**. If Scram is not required pressing any key will cancel the request.

Going into scram mode
in 10 seconds
U/W MUST BE IN THE WATER
Any key to abort

4.3.2 SELECTING A RATE VALUE

SCRAMMER ONLY:

Set a high rate if you are experiencing seal morts to push predators away. Once morts are down, reduce to a moderate or low rate to avoid habituation. If you have low to no seal morts keep at a low rate.

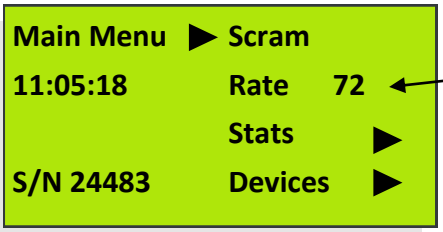
WITH TRIGGERS:

Triggers detect the presence of a predator and signal scrams. The rate should be set to "0" to create scrams only when a predator is near. This is recommended if you have no morts.

You can also set a RATE above "0" when experiencing losses to push predators away. This can be reduced to "0" once predators' behaviour has been changed.

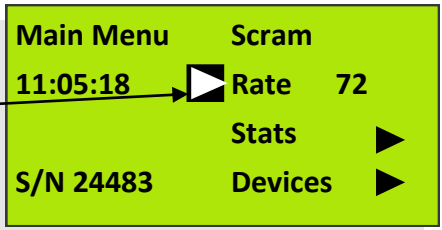
4.3.3 SETTING THE SCRAM RATE

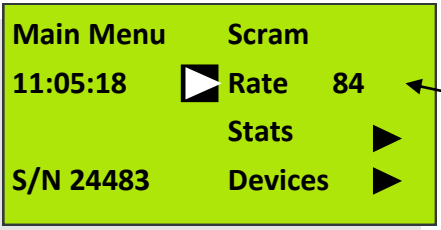
The **Rate** refers to the number of **TIMED** scrams that the scrammer will make in any given hour (0-144 per hour). This rate is independent of 'triggered scrams'.



1) Scroll down to **RATE** option using ▲ ▼ arrows.

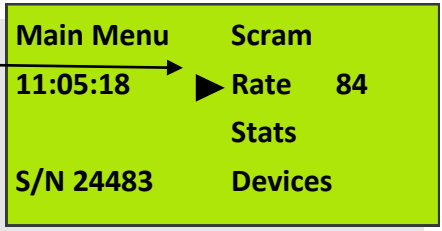
2) Press **ENTER** to enter rate value.





3) Use **+/-** ◀ ▶ to increase the rate to the desired amount (0-144 per hour).

4) Press **ENTER** to select that value.



4.3.4 ALERT FAULTS

A **RED WARNING LIGHT** will show if:

1. BATTERY IS LOW.

The user receives an Error message. Check battery status on power settings.

2. THERE IS A FAULT: The "**ERROR**" code appears on the standby screen on the first line instead of "System ok". Press **ENTER** to see the specific fault and solution.

FAULT CODES:

CABL – Check cable connections and "**If damaged replace."**

BAT FAIL – The battery is dead. Replace battery.

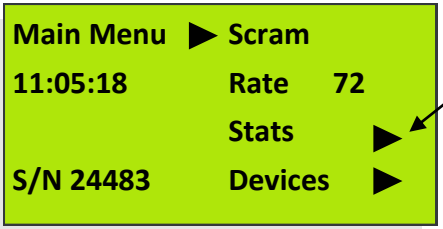
U/W / SCRAM FAILURE—A problem has arisen in the underwater body. Please "**Service unit**".

CODE FAIL – If a fault code appears please contact Ace Aquatec for further instructions.

If multiple errors have occurred the display will scroll through each error at 10 second intervals (or when a key is pressed). 10 seconds after the last error message the system reverts to the Normal screen.

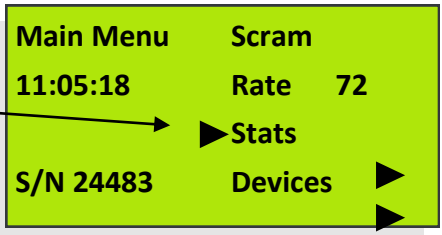
4.3.5 TRIGGER DATA

Stats stores information from external triggering devices, such as fish motion detector triggers or sonar triggers.



1) Scroll down to **Stats** option using ▲ ▼ arrows.

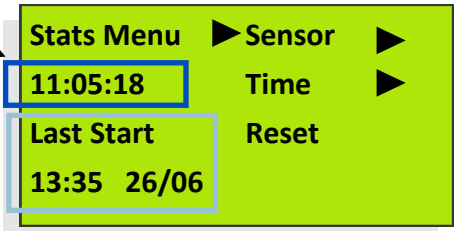
2) Press **ENTER** to open stats menu.

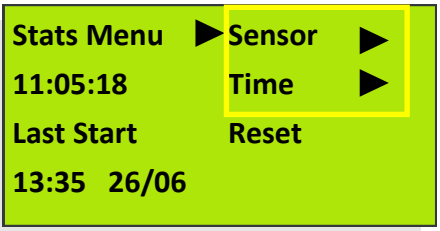


4.3.6 Stats Menu

Current time.

The time from which all stats have been recorded. Scroll to **reset** and press **Enter** to begin stats recording from current time.





Scroll to **Sensor** and press **Enter** for hits for each trigger number. Scroll to **Time** and press **Enter** for chronological records of hits.

4.3.7 Sensor Data

Reading each line from left to right, each block represents a trigger, each number recorded represents the hits for that trigger.

25	3	2	13
5	2	11	15
5	16	25	12
14	5	1	11

Trig 2 hits 3

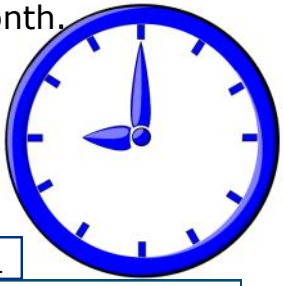
Trig 1 hits 25

Trig 6 hits 2

Pressing **any key** returns to the stats Menu.

4.3.8 Time Data

Press **Enter** to see stats by hour, day, month.



Stats time	▶By Hr
	By Day
	By Mo

1 hr prev. hits 1

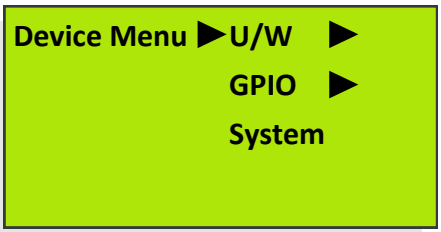
2 hrs prev. hits 4

1	4	8	1
2	1	1	1
2	6	5	2
1	5	1	1

Hour screen details total number of trigger hits detected by US3 in that hr. Top left is 1hr previously, bottom right 16 hrs.

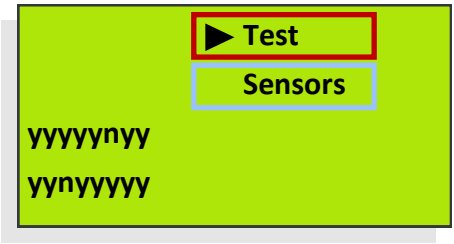
4.4 Devices

The device menu allows core system settings to be changed.



4.4.1 Underwater Body Settings

Scroll to **U/W** and press **ENTER**. The U/W menu allows the user to toggle acoustic output, test the unit, and adjust triggers heard.



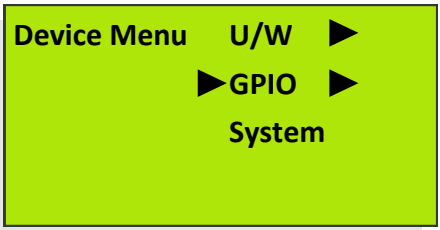
Toggle to test and press Enter to ensure scrammer is receiving an echo and responding. Press **Enter** to select.

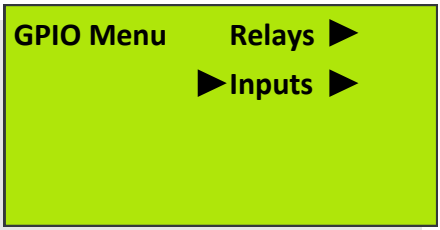
Toggle to **Sensors** and press **Enter** to select which triggers should be recorded. A summary is displayed.

4.4.2 General Purpose Input/Output



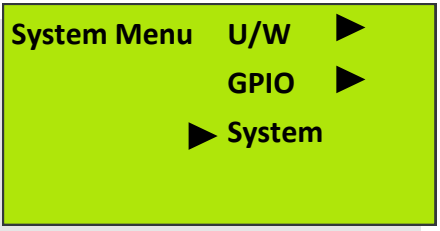
Additional external devices can be connected to the US3 scrammer. The list of these connected devices can be found by clicking Enter on GPIO and selecting either Relays or Inputs, depending on the device attached.

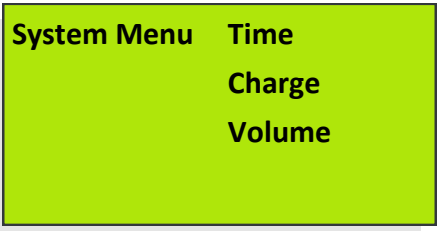




4.4.3 System Settings

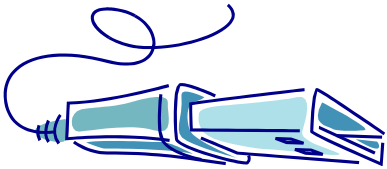
Press **ENTER** to see System Menu where the real time clock can be set, internal battery charged and volume of scrams adjusted. Change each by pressing Enter and using the ◀ ▶ buttons to toggle settings.





5. Software Updates

Updates for the scrammer can be downloaded from our website, supplied on disc, or added by our engineers.



Ensure the top box and underwater body are connected, and that mains or batteries are supplying power.

Insert the update cable into the utility connector port and the other end into your computer's USB port. If the software has been added to your computer the programme should start running immediately.

6.MAINTENANCE

Regular maintenance will prolong the life and effectiveness of your system.

OCCASIONAL:

1) Check the underwater cable for abrasions.

2) Check the surface unit connectors to ensure they have not been damaged.

REGULAR (DAILY)

1) Press the **Test button** to ensure the scrammer is reading "**Echo**" and is making a noise (scram mode).

2) Check the **power settings**. If **BAT A/B** reads under 120 (**12.0 volts**) then change the battery. If running from mains, ensure that **AC** reads "**okay**".

REGULAR: (ONCE A MONTH)

1) Put in MUTE mode and remove the **underwater body** from the water and pressure wash to remove any build up of organic material.

2) Clean **battery terminals** with a wire brush to avoid corrosion. Apply electrical grease to keep good connections.

3) Lift **triggers** to check each are working. You will hear them make a noise in the air when knocked (they have a time-out so will not make a noise immediately after being triggered). Clean.





ANNUAL:

Return the complete unit for servicing every year (or whenever your sites are fallow).

7. STORAGE

The system should be fully charged before storing (use **CHARGE** setting, see 4.4.3, and wait until the "*" has returned to "V").

The control box should be disconnected and all connectors should be protected from dust and water.

The **MAGNETS** should be replaced on the Trigger Devices. The underwater unit can be stowed safely on the battery cover, and two ties will hold it in place.

8. UK & INTERNATIONAL DISTRIBUTORS

UK RETURNS, SERVICING & REPAIRS

Neptune Sonar, Kelk Lake, Kelk, Driffield, Yorkshire, YO25 8HG. Email: nathan@aceaquatec.com

SHETLAND AND ORKNEY

Agmatek Engineering, 1 Haldane Burgess Crescent, Lerwick, Shetland ZE1 0PN. Email: gerry@agmatek.co.uk

CANADA AND USA

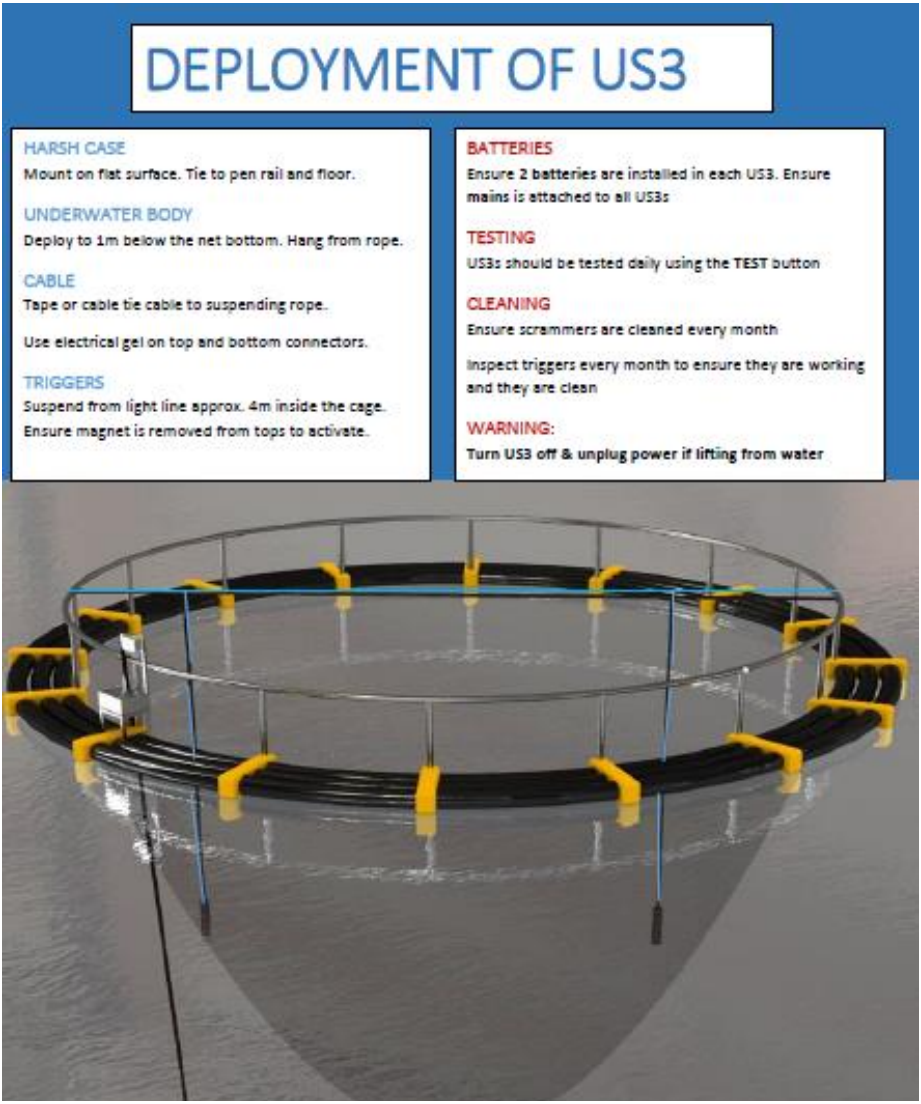
Triton Aqua Technologies. Email: ross@aceaquatec.com

CHILE

Email: nathan@aceaquatec.com

8. ADDITIONAL DOCS

Additional deployment and user documents can be downloaded from the 'Documents' section of the US3 product page on our website: www.aceaquatec.com

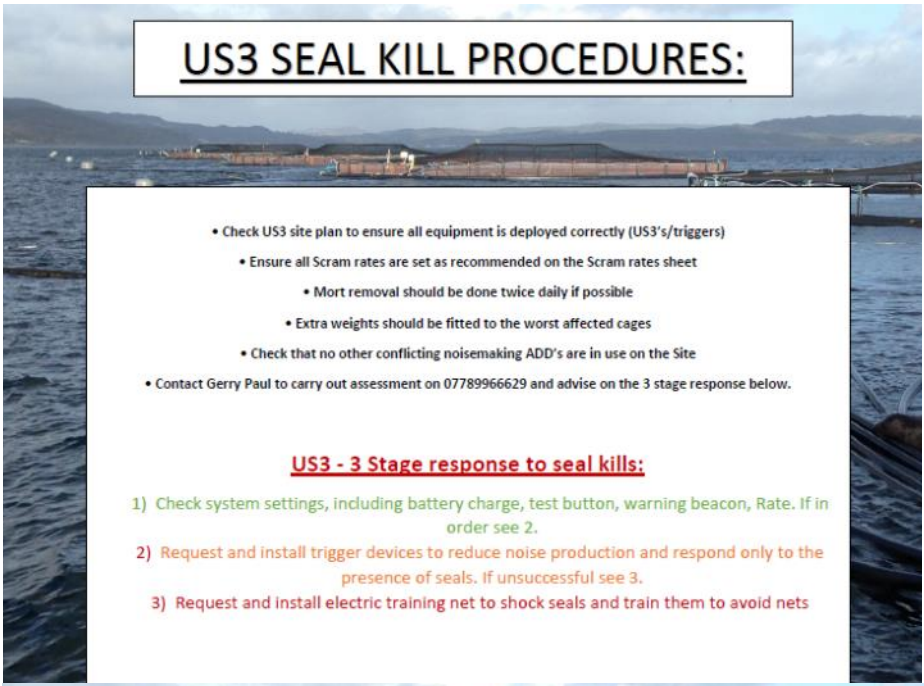


RATE SETTINGS FOR US3

RATE SETTINGS

Based on Seal morts with triggered or continuous US3s

MORTS	RATE	WARNING!
HIGH	144	• No longer than 2 weeks • Check power settings daily • Shift rate to 72 when Morts reach MEDIUM
MEDIUM	72	• Use until Morts reach Low • Check power settings every 2 days • Shift down to 36 when seal morts are low
LOW	36	• Maintain level if morts are rare • Check power levels every 4 days
NONE	12	• Maintain level if morts are gone
NONE	0	• TRIGGER USERS ONLY! • Once the seal morts are very low or gone you can set Rate to Zero and the US3 will scram when a seal is detected.

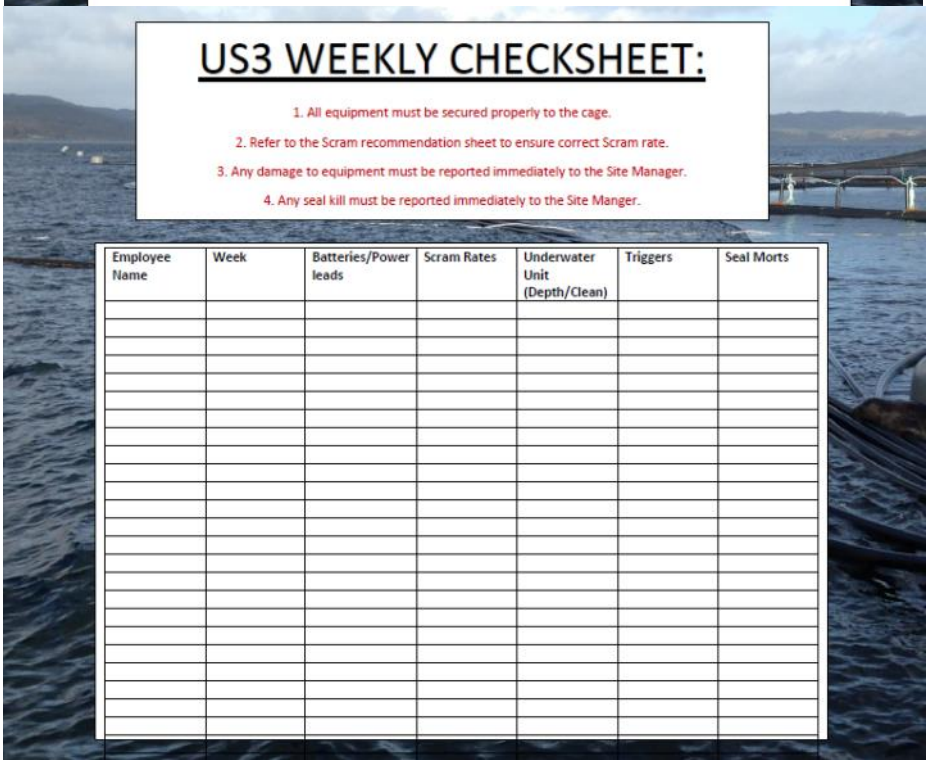


US3 SEAL KILL PROCEDURES:

- Check US3 site plan to ensure all equipment is deployed correctly (US3's/triggers)
- Ensure all Scram rates are set as recommended on the Scram rates sheet
- Mort removal should be done twice daily if possible
- Extra weights should be fitted to the worst affected cages
- Check that no other conflicting noisemaking ADD's are in use on the Site
- Contact Gerry Paul to carry out assessment on 07789966629 and advise on the 3 stage response below.

US3 - 3 Stage response to seal kills:

1) Check system settings, including battery charge, test button, warning beacon, Rate. If in order see 2.
2) Request and install trigger devices to reduce noise production and respond only to the presence of seals. If unsuccessful see 3.
3) Request and install electric training net to shock seals and train them to avoid nets



US3 WEEKLY CHECKSHEET:

1. All equipment must be secured properly to the cage.
2. Refer to the Scram recommendation sheet to ensure correct Scram rate.
3. Any damage to equipment must be reported immediately to the Site Manager.
4. Any seal kill must be reported immediately to the Site Manger.

Employee Name	Week	Batteries/Power leads	Scram Rates	Underwater Unit (Depth/Clean)	Triggers	Seal Morts

NEPTUNE SONAR LTD
KELK LAKE
KELK
DRIFFIELD
EAST YORKSHIRE
YO25 8HG

Declaration of conformity

No. NP-US3-13

Supplier: **Neptune Sonar Ltd.**

Address: **Neptune Sonar Ltd,**
Kelk Lake,
Kelk,
Driffield,
East Yorkshire,
YO25 8HG,
United Kingdom.

Product: **US3 Seal deterrent.**
The product described above is in conformity with:

Low Voltage Directive (LVD) 2006/95/EC

- EN61010-1:2001

Electromagnetic compatibility Directive (EMC) 2004/108/EC

- EN 61000-3-2:2000 Electromagnetic compatibility (EMC)
  Part 3-2: Limits - Limits for harmonic current emissions.
- EN 61000-6-2:2001Electromagnetic compatibility (EMC)
  Part 6-2: Generic standards - Immunity for industrial environments.
- EN 61000-6-4:2001 Electromagnetic compatibility (EMC)
  Part 6-4: Generic standards - Emission standard for industrial environments.

Signed .....Managing Director.

USER GUIDE

2.2